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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/020,920	12/19/2001	Helmut Mangold	39509-176287	8866

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EXAMINER	
NGUYEN, NGOC YEN M	
ART UNIT	**PAPER NUMBER**
1754	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/07/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/020,920	MANGOLD ET AL.	
	Examiner	Art Unit	
	Ngoc-Yen M. Nguyen	1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 February 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-7,10 and 11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 3-7, 10-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 21, 2007 has been entered.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3-7, 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over CA 2,223, 377 in view of Vanell (6,423,638) or Hall et al (6,372,648) .

CA '377 discloses a process for preparing pyrogenically-prepared oxides of metals and/or non-metals, wherein an aerosol is fed to a flame such as is used for preparing pyrogenic oxides by flame hydrolysis, the aerosol being homogeneously mixed with the gas mixture for flame oxidation or flame hydrolysis prior to reaction, the aerosol/gas mixture is allowed to react in the flame and the resulting doped pyrogenically-prepared oxides are separated from the gas stream (note claim 3). The aerosol is produced by nebulization using a two-fluid nozzle (note claim 5). CA '377

further discloses that the doping component is from 0.00001 to 20 wt%, preferably from 1-10,000 ppm (note claim 2) and the doped oxides have a BET surface area between 5-600 m^2/g (note claim 1). These ranges overlap the claimed ranges. With respect to the encompassing and overlapping ranges previously discussed, the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time of invention to select the portion of the prior art's range which is within the range of the applicants' claims because it has been held prima facie case of obviousness to select a value in a known range by optimization for the results. *In re Boesch*, 205 USPQ 215. Additionally, the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness. *In re Malagari*, 182 USPQ 549.

The doped metal oxides can be potassium-doped silica (note Example 5).

From Figure 1, air is fed with hydrogen and $SiCl_4$ and later as "secondary air", the air in these steps are considered as "adding oxygen" as required in the instant claim 11 since the instant claim does not require the oxygen to be pure oxygen.

For the "spherical shaped" and pH limitations, since the process disclosed in CA '377 is the same or very similar to the claimed process, the silica product of CA '377 would inherently have the same spherical shape and the same pH characteristic as the claimed product. Moreover, it is well known in the art that flame hydrolysis produces mostly spherical particles.

CA '377 does not disclose specifically the breadth of the distribution of particle size, the pH or the absorption of dibutylphthalate of the oxide product.

In case the product of CA '377 does not inherently have the same breadth of distribution of particle size, the desire of monodispersed product is well known and conventional in the art. Thus, it would have been obvious to one skill in the art to subject the product of CA '377 to a screening process in order to obtain a monodispersed product.

CA '377 teaches that the product can be used as fillers, as polishing materials for polishing metal or silicon wafers in the electrical industry, such as CMP applications, etc. (note page 4, lines 11-21).

Vanell '638 is applied to teach that ideally, a polishing slurry comprises abrasive particles having a size distribution in a narrow range, i.e., the abrasive particles are of uniform size (note column 2, lines 47-50). When the polishing slurry has a wide distribution of particle sizes, the filter is used to filter out particles above a predetermined size (note paragraph bridging columns 2-3).

Alternatively, Hall '648 can be applied to teach that CMP finds extensive applications in the Shallow Trench Isolation (STI) process to planarize uneven surfaces. Silica powder with tight particle size specifications is preferably selected as abrasive component for this CMP process because it produces smooth, scratch free surfaces (note paragraph bridging columns 1-2).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to either optimize the process condition of the process of CA '377

to produce a product with narrow particle size distribution or to use a filter to remove particles outside of the predetermined size, as suggested by Vanell '638 or Hall '648 because the product of CA '377 is suitable for being use as polishing materials, such as in CMP application and such polishing materials are desired to have uniform particle size as disclosed in Vanell '638 and Hall '648.

Applicant's arguments filed February 21, 2007 have been fully considered but they are not persuasive.

Applicants argue that the criticality of the claimed ranges and/or step sequence is apparent from Figures 11A-11B (Table 4 and Example 7 (20% potassium dopant)). These figures should be contrasted with Figures 8A-10B (Table 3 and Example 1 (no dopant)).

Any criticality or unexpected should be compared to the closest prior art, in this case, CA '377. In CA '377, potassium is clearly disclosed as a dopant for the silica product.

Applicants argue that the instant claim 1 now specifies the threshold concentration that results in the morphological changes necessary for the narrow range of particle size distribution.

Even though in the Example 5 of CA '377, 0.5% aqueous potassium chloride solution was used to produce silica with 300 ppm potassium dopant, however, the teaching of CA '377 should not be limited to just the example. CA '377 does teach that the doping component can be from 0.00001 to 20 wt% (i.e., 0.1 to 200,000 ppm),

preferably from 1 to 10,000 ppm (note claim 2). This range overlaps the claimed range, thus, it would have been obvious to one of ordinary skill in the art to use the process of CA '377 to produce silica with higher amount of potassium dopant. In the event that the process of CA '377 would not inherently produce silica product with narrow particle size distribution as required in Applicants' claim, it still would have been obvious to one skilled in the art to subject the product of CA '377 to a classifying step to obtain a monodispersed product as suggested by Vanell (note the above rejection).

Applicants' comment regarding '719 patent is noted, however, sine there is no '719 patent involved in the rejection, it is unclear what is the '719 patent.

Applicants argue that Mangold, i.e., CA '377, does not recognize the criticality of claimed distribution range.

Even when the process of Mangold does not inherently produce a doped silica product with the claimed distribution range, Mangold still teaches that the silica product is suitable to be used as polishing materials (note page 4, lines 11-16) and Vanell is applied as stated in the above rejection to suggest that polishing material is desired to have uniform size. It would have been obvious to one skilled in the art to subject the product of CA '377 to a classification step to remove any undesirable particles or to optimize the process of CA '377 in order to obtain uniform particles for use as polishing material as suggested by Vanell. It should be noted that Hall '648 is now applied to teach silica is desired to have tight particle size specifications for a CMP application.

Applicants argue in Example 5 of Mangold, the content of KCl taught in Example 5 is 0.5% and there is no mention of the claimed potassium content (dopant amount) and the oxygen introduction step of claim 11 is not taught or suggested by Mangold.

In Mangold, i.e., CA '377, the dopant amount for K in Example 5 is 300 ppm or 0.03% (note Table 2, last line for Example 5). However, the teaching of CA '377 should not be limited to just the Example 5. Again, CA '377 discloses that the amount of dopant can be up to 20%. Also, for claim 11, as stated in the above rejection, the "secondary air" as shown in Figure 1 is considered as the claimed oxygen introduction step.

Applicants argue that Vanell does not mention alkali doped silica.

Vanell is only applied to teach that when silica is used as a polishing medium, the silica is desired to be monodispersed, not to teach the alkali doped silica or other limitations as argued by Applicants.

Applicants argue that Vanell merely discloses the filtering of a colloidal silica suspension.

Regardless of what type of silica used in Vanell '638, Vanell'638 still teaches that abrasive particles, i.e., silica, used as polishing material in semiconductor purposes should have narrow particle size distribution and CA '377 clearly teaches that the product of CA '377 can be used for such purpose.

Applicants argue that the Vanell filter method only separate smaller particle from larger particles and this is not a method which narrow particle size distribution range having both large and small particles.

In Vanell '683, it is disclosed that ideally, the polishing slurry comprises abrasive particles having a size distribution in a narrow range, i.e., the abrasive particle particles are uniform in size (note column 2, lines 47-50). Vanell '683 also discloses a process for increasing uniformity of particles in a colloidal suspension (note claim 1), this fairly suggests a narrow particle size distribution. Applicants have not provided any evidence to prove otherwise. It should also be noted in CA '377, the particle size of the fumed silica is sub-micron (note Figures 1-2, for the scale of the Figures, note US 6,613,300 which is an U.S. equivalent of CA '377), and the product of CA '337 can be used as starting materials for preparing dispersions as polishing materials for polishing metal or silicon wafers in electrical industry (note page 4, lines 11-16). A dispersion of sub-micron silica product as disclosed in CA '377 is considered analogous to the "colloidal suspension" as disclosed in Vanell.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ullmann's Encyclopedia of Industrial Chemistry, (online version), is cited to show that flame hydrolysis produces mostly spherical particles (note 6.1.2 and Figures 40-41).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner is currently on a Part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ngoc-Yen M. Nguyen
Primary Examiner
Art Unit 1754

nmn
March 5, 2007